

Addendum to M1 Junction 5 VISSIM Model Tests Report

DATE:	12 December 2025	CONFIDENTIALITY:	Public
SUBJECT:	M1 Junction 5 – Croxley Heath Development Tests (2025 with Development, Additional Runs)		
PROJECT:	UK0043555.551	AUTHOR:	D Gooding
CHECKED:	G Higgins	APPROVED:	G Higgins

INTRODUCTION

This Technical Note summarises the analysis of 20 seeded runs of the 2025 with Croxley Heath development in response to queries from National Highways regarding the VISSIM modelling report. The twenty model runs start at random seed number 10 and increment by 7 for each run (i.e. run 10, run 17, run 24 etc).

For clarity the data is presented for the two M1 slip roads only, as that is the matter of interest to National Highways. The directions (north/ south) used in this report are based on the side of the junction that the slip road is located, not the direction of traffic.

QUEUE LENGTHS

Table 1 summarises the maximum queue lengths from each of the 20 model runs for the two M1 slip roads in the AM and PM peaks. T

Table 1 – Maximum Queue Length in Peak Hour (metres)

Run No.	AM peak		PM peak		Run No.	AM peak		PM peak	
	M1N	M1S	M1N	M1S		M1N	M1S	M1N	M1S
Run 1	116	666	91	156	Run 11	193	511	122	172
Run 2	141	262	72	173	Run 12	209	674	99	157
Run 3	108	208	85	138	Run 13	3703	217	91	177
Run 4	325	232	105	158	Run 14	209	240	106	184
Run 5	120	256	85	158	Run 15	139	909	88	190
Run 6	164	190	75	165	Run 16	119	195	86	192
Run 7	135	318	68	139	Run 17	122	215	93	160
Run 8	101	168	73	189	Run 18	134	237	67	162
Run 9	129	295	119	189	Run 19	131	353	93	155
Run 10	3704	314	95	271	Run 20	1023	174	89	186

CLASSIFICATION OF OUTLIER RUNS

To classify if a maximum queue is an outlier compared to other runs, WSP has applied a statistical test rather than apply a visual inspection of the data. This test identifies the interquartile range (IQR) of the modelled maximum queues, which is the difference between the 25% and 75% quartile values. The IQR is then multiplied by 1.5 and then subtracted from the lower quartile (25%) to create lower fence and added to

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the upper quartile (75%) to create an upper fence. Any value that falls outside these two fence values is classified as an outlier.

The report also presents the average (mean) maximum queue and median maximum queue for all 20 runs and for the remaining runs once the outliers have been removed.

AM PEAK

Table 2 presents the quartile data, the IQR, lower and upper fence values and the number of outlier runs identified from the modelled queues for both M1 slip roads for the AM peak.

Table 2 – Quartile Data from AM peak Queue Counts

	M1 North (SB Exit)	M1 South (NB Exit)
Lower Quartile	122	213
Upper Quartile	209	326
Interquartile Range	88	113
Lower Fence (1.5xIQR below Lower Quartile)	-10	44
Upper Fence (1.5xIQR above Upper Quartile)	341	496

This results in the following runs being classified as outliers in terms of queue lengths:

- M1 North = Runs 10, 13 and 20
- M1 South = Runs 11,12 and 15

Table 3 summarises the mean and median maximum queue lengths with and without the outlier runs for the AM peak.

Table 3 – Average and Median Queues with and Without Outlier Queues from IQR Assessment (AM)

	Mean Maximum Queue		Median Maximum Queue	
	M1 North	M1 South	M1 North	M1 South
With Outliers	551	332	137	248
Without Outliers	153	242	134	232

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It is evident that the average maximum queue in the AM peak is being significantly affected by the outlier runs. It is also noted that the two longest queues on the two slip roads after the statistical outliers are removed fall within the fence boundaries set out above are still much longer than the next longest queue in other runs.

PM PEAK

Table 4 presents the quartile data, the IQR, lower and upper fence values and the number of outlier runs identified from the modelled queues for both M1 slip roads for the PM peak.

Table 4 – Quartile Data from PM peak Queue Counts (metres)

	M1 North (SB Exit)	M1 South (NB Exit)
Lower Quartile	82	158
Upper Quartile	96	187
Interquartile Range	14	29
Lower Fence (1.5xIQR below Lower Quartile)	62	113
Upper Fence (1.5xIQR above Upper Quartile)	116	231

The following runs have queue lengths that fall outside the upper and lower fence values in the PM peak:

- M1 North = Runs 8 and 10
- M1 South = Run 9

It is noted that both “outlier” runs identified from the above analysis of the M1 North slip road sit within 6m of the upper fence. Consequently, these runs have not been removed from the analysis. Table 5 shows the mean and median maximum queue lengths with and without the outlier runs for the PM peak.

Table 5 – Average and median queues (metres) with and without outlier queues from IQR assessment

	Mean Maximum Queue		Median Maximum Queue	
	M1 North	M1 South	M1 North	M1 South
With Outliers	90	174	90	168
Without Outliers	-	168	-	169

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It is evident that removing the single outlier run from the M1 South queue analysis has a negligible impact on the average and median maximum queues in the PM peak.

FINAL QUEUE ANALYSIS

Table 6 presents the maximum queue lengths for the two M1 slip roads for the AM and PM peaks with the queues that are regarded as outliers removed.

Table 6 – Maximum Modelled Queue Lengths (metres)

	M1 North	M1 South
AM peak	325	353
PM peak	122	192

The AM peak queue of 353m on the M1 South slip road was recorded for one cycle of the traffic signals before the queue length reduced back to around 250m or less for the rest of the peak.

All of the above queues can be accommodated within the length of the slip road without extending back onto the M1 mainline. It is therefore concluded that traffic from the proposed development would not have a significant impact on the M1 slip roads and would not cause queuing back onto the M1.